

# Aviation News

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OCTOBER 25, 1943 50 CENTS



*CAB's chairman L. Welch Pogue, who emphasizes that past statistics on surface transportation are no key to future airline traffic because aviation, like the railroad and automobile before it, will accelerate national and international trade to unprecedented activity.*

## **October Plane Output May Hit 8000**

Primary materials adequate, with only shortage apparent in bearings; labor still principal problem; 9,000 monthly peak near.

## **Congress to Decide GAO Contract Dispute**

Aircraft industry seeks sizable payment on terminations, with protracted bookkeeping postponed.

## **New Giant Blimp Passes Navy Tests**

Goodyear Aircraft's M-1, largest non-rigid airship, completes tests prior to joining war against German submarine menace.

## **Are Bomber Losses Too Costly?**

Military commentator says Axis toll gives false impression, while editorial asks for more realism in loss reports.

## **Missouri Pacific Files for Airline**

Application for 108 cities brings to more than 60 the number of common carriers asking CAB for air service.

## **Sikorsky, Stout Back Greyhound Plan**

Engineers testify at CAB hearings that proposal for 14-passenger air bus is practical, with production within a few years.



ONE REASON for America's highly successful germanium bonding is the Automatic Pilot, developed and manufactured by Minneapolis-Honeywell. Until recently, details of this super-sensitive electronically controlled instrument were secret, but it can now be said that the M-H Automatic Pilot not only accurately directs the ship, but on landing also actually holds the plane on a designated course over the target, providing a stable platform from which bombs are released.

The Automatic Pilot is but one of a number

of aids to aviation which Minneapolis-Honeywell Engineers have developed and are producing, and which are in daily use in every war theater.

When the time comes, Minneapolis-Honeywell will be ready for peaceful aeronautical problems. We therefore invite your future control problems on the basis that we have proved both our engineering and our manufacturing ability and can obviously help you with your future plans. — Minneapolis-Honeywell Regulator Co., Aeronautical Division, 1947 Fourth Avenue S., Minneapolis 6, Minnesota.

# MINNEAPOLIS-HONEYWELL

## AERONAUTICAL INSTRUMENTS



### THE AVIATION NEWS

## Washington Observer

**PRIVATE GENERAL ARNOLD**—The commanding general of the Army Air Forces rarely holds a news conference and when he does it's an event. When he finally does hold a news conference and then has the working press generally, that's more than an event. It's a time for revels of champagne and there were plenty of them in Washington last week when it was learned that Gen. Arnold was holding a news conference—admittance by invitation only.

**SELECTED LISTS**—The lists on which the chosen few were selected was not disclosed. Even reporters who have been covering the War Department regularly for months were not admitted. It was reported that only three of the many machines with Washington correspondents were permitted to have representatives on hand. A few publishers who haven't written a story in years were there. The chiefs of some of the news bureaus were invited but not their staff members who ordinarily write stories about the Air Forces. A carefully selected list of radio commentators was permitted inside as was another carefully selected list of columnists. Just where the line was drawn is not clear. Why some newsmen were chosen to hear the Air Forces story from Gen. Arnold and others were not considered qualified has not been explained. There are quite a few members of the Washington press corps who would like to know.

**PILOT PLANT VISITS OUT**—The practice of having returning pilots and planes visit aircraft plants as part of the employee morale program has been quietly curbed. Industry representatives say such programs are great morale boosters and that the workers are inspired by the sight of a battle-tested warplane they have helped build and a few words from pilot and crews who have flown those airplanes.

**CONTRACT RENEGOTIATION**—Sunderly may there will be little if any change in the renegotiation laws after Congress gets through working it over, and, what is more disappointing to the aircraft industry, it does not appear at this stage that any provision will be made for funds for reconversion in post-war production. This despite the fact that many members of Congress are expressing a growing concern over the financial fate of various war industries in their own communities. In this connection, it would be well to watch the General Revenue Bill with which the Ways and Means Committee is now wrestling.

**SALES TAX**—In connection with the tax bill, there is more and more talk about a sales tax. The treasury never has liked it, still doesn't like it and probably never will like it, especially with elections coming up. But high treasury officials admit it may be an out. Aside from the revenue features of such a tax, its advocates point out that repeal of the Victory tax, which is being considered, would free some 5,000,000 persons from payment of Federal income taxes. Disregarding the advantages or disadvantages of the sales tax, it appears now that there will be both a Committee and House vote on it before the tax bill is passed.

**TAX ON GOVERNMENT MACHINERY**—The Government has asked the Supreme Court for a ruling on whether the states have a right to levy property taxes against Government-owned machinery placed in war plants. The Government contends that the property, being federally-owned, is not taxable by the state.

**NAVY LAND-BASED BOMBERS**—There's been a lot of talk lately about the Navy's land-based aircraft but the old reliable "Corsair" patrol bombers are still cutting off the bases in



members embarrassing to the enemy, probably even more embarrassing if they knew how many women are working on the construction of the "Corsair." Incidentally, Secretary Knox, himself, tipped the Navy's hand on Consolidated

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*Electrical Components*

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B-24 "Lakesters" while telling the press of his recent trip abroad. He described an airbase being taken over by the Navy with "several squadrons of B-24s" operating against submarines.

**INTERNATIONAL AIR ROUTES**—This issue is becoming hotter by the minute, so hot, in fact, that the House Interstate and Foreign Commerce Committee during recent executive sessions discussed whether it should be isolated for State Department consideration, rather than left with the Civil Aeronautics Board swamped with domestic route applications. It finally decided, however, that CAB should continue to devote its attention to the matter and no committee action was taken.

**LOCAL-FEEDER-PICKUP**—Hearings on this problem before the CAE have caused Congressional ears to prick up a little and there were some reports that the whole question might be aired in Congress. Inside opinion, however, was that the need for such service is something for strictly CAE attention and that the Board is doing a good job of obtaining facts on which to base a fair, juridical view of the problem.

**CONRAIN CHAMPIONS**—You may have heard the observation by now, but we talked to a Marine flyer the other day who told us—deadpan—while we were discussing the Corsair, that

**CENSORSHIP LID LIFTED—SLIGHTLY.**—You may have noticed that you're getting weather forecasts over the radio again. On the face of things it may not appear like much. There are institutions, however, that it may be the forerunner of a lightening of the censor's hand on other items in the war program, perhaps production figures. It is well known now that production figures originally were kept under wraps because they were unimpressive and we didn't want the enemy to know how little we were producing. Need for that sort of precaution seems to have passed.

**THE B-29**—The Nazi High Command at least have heard about the B-29 by this time. At present they have heard about our new super-bombers under the name of *super-Flieger Forcemen*. We have referred to the Boeing Flying Forcemen and the Consolidated Liberator as the last of the small bombers. We have been able to talk and write about the new big bombers with a range and lead far exceeding our present four-engine bombers. But to mention B-29 was cut. The designation was a secret. Not the bombers themselves, mind you, but the designations. There was so much hush-baby operation that even the people who didn't know a P-46 from a C-47 got to know what the B-29 was and so.

**TITO PROTESTS**—The ceremony at Belgrade Field the other day, attended by President Belgrade, the Yugoslav AAF officers, during which Gen. "Liberal" were taken over to the Yugoslav Air Force, might have been—and as a matter of fact was—seen by the Yugoslav government-in-exile. But it was labeled as a "Munich which we can not allow to happen" by Gen. Tito, leader of the Yugoslav Partisans who would like to have some business himself. The government-in-exile arrives are led by Gen. Draža Mihailovic, Tito's rival.

**JAPS APE GERMANS**—Competent military authority has it that the Japs, like the Germans, are now concentrating their aircraft production on fighter planes—a strong indication of defensive tactics. These same authorities point out that a shift to fighter planes probably will mean a tank increase in aircraft produced.

**LIGHT PLANES**—Among the many aviation studies made recently is one on light or personal plane production possibilities to determine types of planes which may be available to private flyers after the A-10 is lifted. The report was not made with the idea of making it public. It was ordered by William A. M. Eardon, special aviation assistant to the Secretary of Commerce.



*Newspapers on the line at Change Vought*

the Navy must have made a mistake. Why? asked the Observer, with pencil poised. Why, replied the Marine flyer with a grin, is that Corsair they really gave us a good airplane.

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## Don't Underestimate Post-War Airline Possibilities, Pogue Warns

Urges broader thinking and less attention to past statistics in estimating future per capita passenger volume, forecasts lower rates that will combine with speed and flexibility to set new demands by business.

By MERLIN MICKEL

You can't judge air transportation's future by current travel statistics if you do the broader thinking about post-war aviation that L. Welch Pogue, Civil Aeronautics Board chairman, thinks necessary.

Speaking last week before a group studying post-war problems at McGill University, Montreal, Pogue said he hoped Canadians' lives will fall into this error. It arises out of the failure to consider the history or to reorganize the character of volume passenger travel.

• **Sees vast new travel field**—The CAB chairman used a good many glowing phrases, declaring, for instance, that "There is a facility for transportation which represents as great an improvement over other present means of movement of people and cargo as did railroad and steamship at the time they made their appearance. It has unprecedented speed, it is highly flexible. It translates distance into terms of hours—it has conquered time. It has the power to go anywhere over the earth—it has destroyed all barriers of land and water."

The decade after the war, he said in his own interpretation of the history of volume passenger travel, will see a doubling of overseas traffic, with the major portion of these passengers going by air.

• **Rate cut forecast**—Rates for such air travel, he predicted will be leveled to about 7½ cents a mile "almost immediately," and "it is more than likely that they will continue to decrease at a lower rate to five cents and proceed more slowly to within a close range of four cents."

He also thinks all domestic and virtually all international first-class mail will go by air, and that air

in bulk to 34 or 40 cents per ton mile, and then decrease gradually to about 15 cents a ton mile, followed by a further downward trend.

Transportation cargo rates will tend to be slightly higher than domestic, and this traffic may be expected to develop more slowly. But the outlook for air cargo is such that revenue from it probably will be more than that from passengers.

Preferred common carrier—in the United States, Pogue said, the airplane will be the "Preferred common carrier for intercity travelers." With aircraft improvements and increasingly efficient operations, he has no doubt rates will drop from the present 8 cents a passenger mile to 4 cents and "there is every reason to believe they will maintain their downward trend to a level of approximately 3 or possibly 2½ cents."

Furthermore, the resultant "free" economy will develop a volume of business and pleasure traffic that will require frequencies of service



### NATS' NEWEST AND BIGGEST

Morris Moss is shown just before her takeoff on a grueling endurance flight in which she stayed in the air more than 32 hrs. The growing Trans Air Transport Service will get its largest single addition when this world's largest flying boat goes into operation as an overseas cargo carrier. Originally designed as a patrol bomber, the Moss has undergone structural and engine changes and tests necessary for conversion to service as a NATS workhorse.

spaced only a few minutes apart, between an increasingly large number of cities which will grow closer together.

**Post-War Opportunity**—Foresaw that growth trends in air transport will resume at the war's end. While he conceded that "Presently, transport is not needed as much as it is in a detailed prediction of the future, he declared preparation for post-war opportunities a necessary failure to recognize the "absolute necessity of air transportation" he blamed for some errors of prediction.

He stressed the development of long-haul traffic as "the most striking domestic development which will be made by air transport to Canada and the United States, and to every other nation having great distances which enhance the speed value of air transportation."

**Bridge Nations Closer**—Internationally, the greatest contribution will "come from air in gathering and development of new communities of interest between nations remote in miles but close in hours."

In air mail, potential interest in long distance mail appears, he said, to be the most significant development "socially and economically," but despite great mail possibilities, no field of air transport presents opportunities as great and "ultimately exploitable" as air cargo.

**Speed, Safety, Value**—Yet, because the airlines stand as passenger carriers, the airplane's adaptability to freight actually has not

been tested. He suggested that soon may become a commercial basis of necessity. Flexibility of the airplane in scheduling and frequency of service and speed of air carriage are factors the full force and possible effect of which have not yet been measured in peacetime commercial service. They will certainly result in a re-evaluation of our economic life.

Rate of cargo rates are "coming down rapidly and dramatically," according to Page, "the airplane will not only take a portion of the long-haul traffic from the railroads, but, as do the railroads, it will continue to extend the length of the service held by the creation of new long-distance traffic," not only in cross-country but in area, but in international existence as well.

**Global Transport**—The international field, in fact, may be expected to produce some of the biggest developments in air cargo, but it still is in the infancy of development and is not able to approach mail ocean rates for a long time, he declared.

Already, he said, value of air transportation's greater speed has been demonstrated. "Change days to hours and days to minutes, and you have saved the contribution of air transportation to business."

## ASF Reorganization:

Reorganization within Army Service Forces shifted the educational and training functions of special

service divisions from its morale and entertainment activities to the division of military training under Brig. Gen. W. H. Arnold.

Other changes put the specialized training or college program under the director of military training instead of under the director of equipment. The WAC division now reports directly to the ASF commanding general instead of to personnel, with the WAC training program under military training Army Exchange Service, which operates the post exchanges, is no longer under supply but personnel.

## New Lea Measure

### Is Ready for Vote

Battle format over separate bill on removal of surface carriers.

The Lea bill, reviving the Civil Aeronautics Law, was expected to come up for consideration by the House in the coming week. There was some doubt that it would pass. After a fourth revision the bill, formerly known as HR 1012, was recently reported out by the House Interstate and Foreign Commerce Committee with a new number, HR 3420.

To open the way for early enactment, the controversial clause, 448, was eliminated from HR 3420, making it a separate unit. That, Section 406, which is in force as is, and will as soon when HR 3420 becomes law. It will not be changed until action is taken on HR 3481, a separate bill containing amendments to Section 406. No date has been set yet for hearings on this bill. Section 406 deals with the broad question of airline mergers and particularly with the extent to which surface transportation may enter into air operations.

**Battle Over Section 406**—There is an underground battle in progress over Section 406, in which the chief belligerents are railroad and bus lobbies fighting for legislation which would prohibit or restrict air-rail-railway service in competition with existing airlines. These lobbies, representing interests vastly greater than air transport, are armed with large budgets and strong political influence.

Of course, HR 3420 will have to be passed by the Senate and approved by a conference committee before it goes to the President for signature. Except for removal of Section 406 there were no major changes from recent drafts.

## Congress to Rule on Right of GAO To Audit Cancelled War Contracts

Aircraft industry, already in precarious financial position, seeks sizable cash payment on termination of orders, with protracted bookkeeping to be done later; compromise expected.

By BLAINE STUBBLEFIELD

Congress will determine whether the General Accounting Office shall have the right to demands to audit cancelled war contracts. Lecher, such settlement of the manufacturers' claims. The aircraft industry, in view of its cash position which already has been explained to Congress as precarious, mildly advocates substantial payment on cancellation claims first—and auditing afterwards. Negotiation on many World War I contracts continued for 15 and 20 years.

The industry wants legislation making mandatory, not merely permissive, the payment of 90 percent of such amounts as aircraft producers may certify are due them on account of termination of these contracts, plus loans. And manufacturers want to deal with the government agency that made the contract and which knows every case history and with the comptroller-general or directly with any super-agency set up for the purpose.

**Financial Status Revealed**—Parts of the industry's financial status, its current circulation and post-war problems, together with its recommendations to Congress, were presented last week to the House of Representatives by the House Committee on Commerce by Webb Wilson, treasurer of Fairchild and chairman of the Committee's Contract Termination Committee, before the House. The industry's financial status, Wilson's presentation included a letter from James F. Murray, president of the committee.

The House Committee, now in course of reorganization, spoke for the industry by agreement with the aircraft war production committee, which is prohibited by anti-trust law and by its own regulations from making recommendations to Congress.

**Contract Unilateral Group**—Confronted with the dispute between the War Department and Comptroller-General Lecher W. Warren over auditing procedure, the President announced at press conference that he is setting up a new office of War Mobilization to unify order contract termination and other pro-

blems of all federal war post-war contracts.

The aircraft industry does not oppose the creation of that unit, but under the guidance of OWB Director James F. Byrnes. It is regarded as a necessary authority, to make overall policy, instead of letting every procurement agency set up its own, which would result in overlapping systems in many places.

**Tied in Cost Increase**—It was the Byrnes office which took over the West Coast aircraft manufacturer and issued a directive, for better or worse. At least it told the agencies involved which must do Byrnes is, in effect, a leveler of ambitions among the war agencies. On several occasions, recently, he has brought them to agreement by exchange of letters, which pass over the President's desk to give them weight.

Nevertheless, through its submission to the principle of overall control over war production, the aircraft industry felt that, due to its financial expansion for production of the No. 1 weapon in this war, and due to the resulting thin margin between cash and liabilities (\$1.69 against \$1.00 at the end of 1945), it was in a special consideration. It is believed, in fact, that the House War and Marine Committee, which handled proposed amendments to the reorganization law, will issue its report in a few days, recommending specific benefits for aircraft producers in the form of liberalized renegotiation and tax benefit terms.

**Other Lines Stretched**—It is not only post-war security that the industry, including aircraft, seeks for modification and quick termination settlement. Many of the firms whose contracts are being cancelled now, want their money quick to get back into another order book. About \$3,000 contracts, nearly six billion dollars' worth, already have been terminated by the services and other agencies. As matters stand, the Army and Navy are making cash settlements on a few terminations, but assume that the bulk of the contract termination and other pro-

## Incentive Program

Industry study is being made by West Coast aircraft contractors of incentive pay programs designed to increase production through adoption of two-man-hour shifts instead of three eight-hour shifts.

It was understood that nothing specific has yet been developed, but if equitable systems acceptable to labor can be worked out, it was considered likely that plans of this type may be in operation by the end of the year or shortly thereafter.

There was no inclination to adopt a uniform plan for all plants, but it was stated that programs tailored to needs of specific companies.

While CIO and AFL national officers oppose incentive wage programs, it is believed that if local unions agree with individual plants, national organizations will not object. Some local unions oppose plans involving a specific amount of production within a specific time. There is an overall plan program.

First reports on operation of the West Coast Mergers Program indicate it is working well in its initial applications.

highlight in question by Comptroller-General Warren, who says the General Accounting Office alone can handle claims against the U.S.

**Compromise Likely**—The Army already has wanted permissive power to handle termination settlements. It has not and does not want a mandate for any specified settlements and make loans. To best the comptroller, who is on pretty solid ground, Army certainly will have to compromise, perhaps in the direction of "mutual consent" under Secretary of War Patterson says he wants (1) authority to make advance partial payments, (2) authority to make guarantee or direct loans to private sub-contractors, (3) authority to handle termination claims. He wants authority, but not an order.

As previously indicated by Aviation News (Sept. 26, p. 23) contract termination is tied up with renegotiation with plans to deal with declassification of weapons, with disposal of surplus war equipment (planes, trucks, ships). The President's OWB unit "to deal with war and post-war adjustment problems" partly toward integrated consideration of all these factors.

## New Giant Blimp Passes Tests

Newly new M-1 blimp, largest non-rigid airship ever built, has completed first test flights and will further tests will pass Navy's growing arsenal of weapons against the submarine.

This giant airship, built by Goodyear Aircraft Corp., at Akron, under closest guard and secrecy, is half again as large as the K-type ships used in coastal and anti-submarine patrol.

Disclosure of the new airship was first scheduled for last month and mention widely was permitted to inspect the ship. The Goodyear blimp's many details of its construction were disclosed at that time, including the new one, which is to be three times as long as that on the K-ships. It comprises three connecting units, augmented by universal joints to allow freedom of motion in coordination with the

flexible envelope above. The longer one better distributes the weight along the keel—fixed envelope.

Outrigger carrying two Pratt & Whitney Rump engines are attached symmetrically. A ladder below gives workers access of observation and use of armament.

After this and other information had been released, Navy suddenly withdrew the blimp—fixed envelope and first test flights. Navy is authorized by Congress to acquire 200 airships. It is not known how many will be of the new M-type. An additional number of the K-type ships is now in service.

Capt. C. J. McGee is in charge of the blimp program in the Bureau of Aeronautics. Rear Admiral Charles E. Rosendahl, advocate of lighter-than-air craft, commands the Lakehurst base and program.

# Sikorsky, Stout Back Greyhound Plan For 14-Passenger Helicopter Buses

Aviation engineers testify at CAB hearing on route applications that production and operation of rotor-powered vehicles could be effected immediately.

Igor I. Sikorsky and William D. Stout, leading aviation engineers, believe Greyhound's proposal to use 14-passenger helicopter "air buses" in connection with its bus operations is entirely practical, and say the helicopter has reached the stage where such air vehicles could be built immediately.

They testified in behalf of Greyhound Corp., which seeks local service routes at CAB hearings on local-busder - picking service, and they named a class in Washington.

**Model Displayed** — Sikorsky appears as engineering consultant with Raymond E. Leach, widely known industrial designer who described a proposed air bus.

The proposed helicopter would carry 14 passengers and a crew of two. It would have a gross weight of 12,000 lb., carry a 400-hp. engine with a maximum disposable load of 4,300 lb. Sikorsky stated that from actual experience with the XH-4 of which the Sikorsky division of United Aircraft is delivering a substantial number to the Army, he believes such a craft can be designed and put into production in about 2½ years.

**Single Rotor Craft** — Other features of the proposed craft included a single rotor with three 35 ft blades and a diameter of 100 ft. Two 600 hp rotors, mounted on each side of the fuselage, 33 ft body length, 14 ft height, gas tanks in the housing between rotors and fuselage, four entrances, four and aft, on both sides of the ship. Fuel consumption would be 100 gal. for 150 mi., carrying 600 lb., at 100 mph cruising speed. Vertical climb would be 600 ft. per min., and 1,800 ft. per min. with forward speed. The ship could reach an altitude of more than 10,000 ft. and land on an area 30x50 ft.

**Short Road Advantage** — In Sikorsky's opinion the helicopter will never replace the airplane but he believes that for distances under 200 mi. it will surpass the airplane's business. He likened control of the helicopter to that of the automobile, but said tests show the helicopter can stop more quickly than an auto. He emphasized the high degree of

control already attained. He said that although it is slower the helicopter can now duplicate every maneuver of a plane.

**No Subsidy Needed** — Arthur M. Hill, Greyhound vice-president, contended 1. that if Greyhound and other bus lines are authorized to develop local air service, no direct subsidy by the government will be required; (2) that helicopter air buses would bring travel to millions now lacking any form of modern transportation; and would offer maximum advantages for trips from 50 to 250 mi.

Greyhound introduced detailed maps of proposed routes which would cover nearly 50,000 of the 60,000 mi. over which their buses operate with stops 20 to 60 mi. apart, integrated with the present bus system.

**Experts Testify** — Testimony was also heard from Robert Dransil, general counsel of the Greyhound Corp., and various technical experts. Dr. Richard R. Maude, formerly with the Wharton School of Business Administration, University of Pennsylvania, now retained by Greyhound as an analyst for post-war planning, presented a survey of general economic data concerning towns Greyhound proposes to serve.

An extensive survey conducted

by J. R. Stewart Associates under supervision of Elmo Raper, an travel habits throughout the country in 1941, was submitted as evidence of demand for local air service.

**Experimental Routes Asked** — Greyhound asked to be allowed to set up two experimental routes immediately if equipment could be obtained.

Earlier, recommendations were made to the board by several witnesses that fixed-base operators be allowed to run feeder air services, not only because they already had trained pilots, ground mechanics and experience in this type of operations, but to help alleviate post-war dislocations and unemployment.

## Martin-Nebraska Co. To Build New Plane

Harrison elected head of plant to produce craft "much larger than *Neurosurgeon*."

Joseph T. Harrison, executive vice-president of Glenn L. Martin Co., has been elected president of Glenn L. Martin-Nebraska Co. Omaha. He will retain the executive vice-presidency and will spend most of his time at Omaha.

Martin, in stepping out of the presidency of the Nebraska Co. announced a greatly expanded program for all Martin plants.

**Work on New Plane** — The Nebraska Co., he said, has been selected by the Army to build a warplane much larger than the B-26 Marauder and higher priorities have been granted to insure rapid volume production. Output of the B-26 will be tapered off at the Nebraska plant in preparation for work on the new plane, but will be continued at Baltimore.

It was explained that the new program at the Nebraska plant will require the supervision of a top company executive, which resulted in Harrison's election as president.

## Expansion Curb Eased For Air Industry

The aircraft industry has been afforded less than other industries production by WPB's order of several months ago halting building of facilities for war production.

During August, about \$100,000,000 worth of projects was approved by WPB, of which almost \$55,000,000 was spent on aircraft.

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## Production Parley

War Department has asked 400 leaders of war production and public agencies from mid-western states to meet at Fort Monmouth, N.J., Oct. 28-29 for sessions similar to the conference of industry labor and group leaders in Washington last month and attended by top aircraft company executives.

High-ranking Army officers will govern production leaders will analyze the war situation on all fronts for the war production executives from Michigan, Illinois, Ohio, Indiana, Wisconsin, West Virginia, Kentucky, Iowa, Nebraska and Minnesota.



## DOUGLAS ENGINEER'S POST-WAR THINKING:

**Regular Aircraft** "is committed to engineers to submit their ideas for post-air products which could be built by the aircraft industry throughout the project from J. Gordon Long. The third model raincoat was designed to be made from a single piece of material, with a single seam for perfect usability with plastic canopy, luggage storage behind the seat, 40 kg. rear drive engine which could be removed in 10 min. and replaced by a rental motor during repairs. The door lifts up in front and states back over the seat, and the seat is folded back into the rear of the aircraft. The seat is mounted underneath. Aircraft wheel-type steering allows manual forward, automatically locking pedals with the floor and setting the parking brake. It is released back to driving position by unhooking with key. Top of the seat is folded back into the rear of the aircraft. The car is designed to be primarily for short-distance commuting.

Hiring Rate Order  
Issued Wright Aero

Summary of Actions taken by Government agencies includes WPP, NLRB orders.

In a directive to Wright Aeronautical Corp., Paterson, N. J., setting a 65c hiring rate, and adjusting the job classification schedule, National War Labor Board said "the utmost cooperation of the union (UAW-CIO) and management" was re-

has been made acute by the recent opening of a plant by the company in Woodbridge, N. J., which must be fully manned while new workers are still needed at the Paterson plant. The board did not approve a 7% frozen rate requested by both the union and the company, which they considered would seriously undermine the wage stabilization already achieved in the area.

Based on comparable rates paid in other airplanes and aircraft equipment factories in the Washington, D. C., area, the National WLB ordered pay increases ranging from 10 to 40 cents an hour for employees of the Engineering & Research Corp., Riverdale, Md.

**U.S. War Department** awarded contracts for additional aprons and taxiways at Champaign, Ill., to cost about \$400,000 for a runway and taxiway in Kern Co., Cal., costing about \$200,000, and for reconstruction of a runway in Cumberland Co., N. C., which will cost approximately \$200,000.

War Production Board reinstated a CAA airport project at Athol-Orange, Mass., halted last Jan. 15. All preference ratings have been restored, the airport costing \$438,000.

Defense Plant Corp. executed a contract with Northwestern Aeronautical Corp., Minneapolis, for facilities at a Minnesota plant, costing approximately \$800,000.

■ NLRB directed that an election be held at the Eastern Aircraft Division of General Motors Corp., Baltimore, for team keepers to vote for or against representation by UAW-AMO. The board directed the regional director to request ballots of a run-off election held Sept. 10 at the plant of Green L. Martin Co., Middle River, Md., as certain ballots have been challenged.

PSLEB certified UAW-CIO for mechanics at the Trenton, N. J., plant of the Eastern Aircraft division of General Motors. PSLEB also announced that an election at Lancaster-Kauffman Aircraft Corp., St. Louis, resulted in certification of International Brotherhood of Electrical Workers (AFL) for production and maintenance employees.

Smaller War Plants Corp. announced a new system which will enable small business concerns to get approved loan funds more conveniently. Regional Loan Agents of SWPC now have authority to make loans up to \$25,000 without consulting the national body, subject to certain regulations.

#### A New Plant Opened—The residents

## THE AIR WAR

## COMMENTARY

## Bomber Losses in the Big League: Are They Becoming Too Costly?

Spectacular Axis toll in few raids recently has created false impression of rise in loss rates, whereas record shows drop in cost of allied attacks, Navigator says.

As our aerial blows against Germany mount in fury it has been a foregone conclusion that our losses would become correspondingly severe, especially in the light of the

break up the big crisscross of our Eighth Air Force. Recently many have called attention to the increasing losses of our heavy bombers, and to the principle (old as warfare) that in the long run every offensive weapon is matched by a defensive measure which largely offsets its effectiveness. It is just because this principle is so true that an all-out effort is being made right now to drive the Luftwaffe, Germany's main defense against strategic bombing, from the skies over Europe.

**Relative Bomber Losses—**Contrary to popular opinion, including that of a few military commentators at the time, the relative number of bomber losses over Europe has not increased during the past few months. Although the actual numbers have been high on a few spectacular missions, the overall loss rate is still favorable for publication, but a close analysis of the announced operations of the Eighth Air Force (and its allies) is what we mean by the "big picture." The following table shows the following trend: Since June the monthly total of bomber sorties and tonnage of bombs dropped has grown steadily. (September being drawn double the size of the other months.) The percentage of heavy bombers also has decreased (September's ratio being far lower than June's). The tempo has been so stepped up that the number of sorties flown by more bombers were sent over strategic targets, and more bombs were dropped with devastating effect than in the whole month of September, 1944. The weather, the lack of fuel, and weather attack on Germany

Sept. 27, when Partridge's squadrons dropped marker bombs for the discovery of the following bombers, and sighting Thunderbolts equipped with large drop-tanks went all the way as a record round trip of 700 mi. In June, 90 bombers were lost and in July a record-breaking 115 though a lower percentage than June. Since July, not only the percentage but the actual total of bombers lost decreased up to the end of September. This may not prove true for October and November, as the conditions thus far are very different.

**Yardsticks for Losses**—THEY RAISE the question as to what is the real test of strategic bombing. Is there a true yardstick of air power whereby the ratio of bombers which can be lost can be determined? Several



## 13 HEAT NEMESIS.

the Vega Ventura, land-based patrol plane, the Navy's PV-1, is raising the U-boat's overhead and is hailed as a new solution to underwater espionage. It is as sturdy as the robust Lockheed Hudson it resembles and carries much more fire-power. The recent OWI report on U S combat craft near the Vega PV-1 has greater range and load capacity than the Japanese to offer in this class. Developed by the Navy as an anti-submarine weapon, it has been given greater range and more fire power. OWI says

tion line, as well as vital keys to the Nazi war machine in general. (The RAF bomber command appears to have the job of knocking out large industrial areas with its consequent effect on enemy morale.) Targets such as fighter aircraft and engine factories are of such basic importance to the enemy that they are severely defended with flak and fighters. Destroying such prime targets as the Regensburg Me-108 factory and the Schweinfurt ball-bearing works is bound to take a heavier toll of our precious bombers and their gallant crews.

► **Results Very Sharply**—In the light of these factors, the September record of light losses becomes clear. Except for the big raid on Stuttgart (45 bombers lost against 83 enemy fighters and 30 problems, with no important objectives threatened or destroyed, owing to heavy clouds over the targets), and the highly successful mission against Essen (only seven *Fortresses* lost out of more than 350, with heavy damage inflicted on the port) principally all of the *Fortress* missions during September were unusual fighter air bases and factories in France. Losses in the attacks on the air bases were further cut down by the RAF sending preliminary sweeps of fast, hard hitting *Typhoons*, heavily armed with 36 mm cannon and light bombs.

► **Fighters vs. Bombers Lost**—Another yardstick often referred to in the press accounts of each mission is the ratio of enemy fighters shot

down as against bombers lost. For some months the score has been running between 4 and 5 to 1, and the comparison has frequently been made that this is not high enough. Nor is it, from this viewpoint only. Against 4 or 5 *Nazis* fighters and pilots shot down, many of the pilots leading in Germany and presumably living to fight another day, we are losing too highly trained specialists—the pick of American youth—either killed or captured. Also the Germans can build 15 or 20 single-seat fighter planes for the cost in dollars and man-hours of one *Flying Fortress*. As an attrition factor in the present strategy, however, knocking out these day fighters is highly important, and each mission as the one against Essen, four weeks ago, when some 40 German fighters were destroyed and 38 probably destroyed against our loss of seven *Fortresses* and one *Thunderbolt*, in addition to the heavy bombing damage, constitutes a significant victory.

► **Percentage of Total Strikes**—Still another common yardstick is the percentage of bombers lost out of the total dispatched. (If the figures were available it would be more accurate and provide a better yardstick for comparing one mission against another if the percentage were taken of bombers lost out of those that actually reached the target rather than the total sent out from the home base.)

The figure of 80 percent has been generally accepted as the one be-

hind which bomber missions "do not pay." It is reported the big RAF night attack, the newspapers frequently note that the British Air Ministry reported a loss of say 30 bombers, with the statement that this loss was "not unacceptable."

Needless to say in any given case this may be quite a bit off the beam, but probably on the average it works out fairly well. The even larger recent performance on Oct. 2 (only two bombers lost) was better still, with a loss ratio of less than 1 percent. The big attack on the vital ball-bearing works at Schweinfurt on Oct. 13, made by a large formation, possibly 360 heavy bombers, resulted in an announced loss of 60, or about 30 percent.

► **Real Test**—The true yardstick of strategic bombing and real test of bomber losses comes down to this: Can we, as the enemy, best absorb the losses in bombers and crews which occur in bombing attacks and in the enemy opposition casualties? This in the general test.

► **Special test** for each mission may also be applied, taking careful account of all factors involved. Was the target which was destroyed or damaged important enough to justify the loss of bombers consumed? In the light of the American production and training program there is but one answer to the first question. In nearly every recent case there has been a striking answer to the second one also.

NATION

## Yugoslav-AAF Unit

Four *Liberator* bombers dedicated and turned over to crews.

The first Yugoslavian combat unit in the Army Air Force was activated last week with the dedication at Bolling Field, Washington, of four Consolidated B-24 *Liberator* bombers and their delivery to their American-trained Yugoslavian combat crews.

► **Roosevelt Attends**—The ceremony was held in the presence of President Roosevelt, Maj. Gen. Barney M. Giles, chief of staff, AAF, and top government and diplomatic figures.

Maj. M. V. Mshovich, former Yugoslavian Air Attaché will be in command of the *Liberators* which will be assigned to the Strategic Air Force of the Northwest African Air Force under Maj. Gen. James H. Doolittle. It will operate on a unit, however, bearing the insignia of both the Army Air Force and the Yugoslavian Air Force.

# BANKING SERVICE FOR THE JOB AHEAD

SINCE no man can foresee how long the war will last, it is apparent that industrial management is faced with a two-fold problem. First is the paramount necessity for maximum war production to meet the needs of the armed forces. As Under-Secretary of War Patterson recently said, "The most difficult job of all lies ahead—the drive to victory."

Second only to meeting these vital war-production goals is the job that lies ahead in projecting plans for reconversion or production for civilian use. This job also must be faced now, if maximum post-war employment is to be assured for those at home and for the fighting men when they return.

In meeting maximum production goals, in adjusting production to changing war demands, and in planning for peace-time operations, there are many problems that require banking service. Officers of this Bank are prepared, through extensive experience in handling war-production loans and through practical study of post-war problems, to work with business executives in planning both present and future requirements. We cordially invite your inquiry.

## BANKERS TRUST COMPANY

NEW YORK



### COL. SCOTT VISITS CURTIS:

Col. Robert L. Scott, author of the current best seller, *God Is My Co-Pilot*, visited the propeller division of Curtiss-Wright Corp., where props were made for his Curtiss P-40 fighter *Old Exterminator* in which he downed 12 Japs. With him are vice-president Robert L. Earle, general manager of the division (left), and Lt. Col. William L. Purcell, AAF resident representative at the factory. Col. Scott was commander of fighter pilots in Maj. Gen. Chennault's China Air Task Force from July, 1942, until last January.



## Plane Output Expected To Exceed 8,000 This Month; 9,000 in Sight

Primary material supply adequate except for shortage of bearings; Manpower continues to be principal problem; Army continues to stress heavy bombers.

By SCOTT HERSHY

The upward trend of October aircraft output seemed momentum to such an extent that production experts predicted the industry will go over 8,000 units this month and will "soon" reach 9,000 monthly.

Model changeovers and changes in emphasis within the aircraft program, which caused a temporary lull, apparently have been accomplished and all indications pointed to a record month, substantially above the 7,500 produced in September and the 7,812 units in August, previous record.

**Ready to Fly**—It is important, too, that no incomplete airplanes are being counted in the totals, as was overdone the case in the past. Planes are counted now only after they have gone through the modification centers and been delivered to

particular missions or particular theaters of operations.

There is no more serious shortage of primary materials which upset production some weeks ago. Surveys indicate the U. S. has plenty of aluminum steel and an abundance of steel alloy as well as sufficient aluminum copper and even molybdenum for all purposes.

**Bearing Output Speeded**—The only material shortage apparent at the moment is bearings and concerted efforts are being made to speed their production. Manpower remains the real production problem particularly on the Pacific Coast, but with concentration on this phase of plane production, officials in Washington are hopeful for at least an easing of the situation.

Other reasons for lag in combat

plane production from time to time include engine shortages for some models, redistribution of raw materials, reorganization of plant layout, making up shortages of spares.

**Design Changes**—Constant improvements on models already in use and addition of totally new airplanes slow production, which makes records already set all the more remarkable. Constant development and change cannot help but have a deterrent effect on production rates.

Related to this fact, is its effect on production in any change in emphasis within the aircraft program. One of the best examples of this, as outlined in the recent Office of War Information report on U. S. combat planes, is the recent decrease in the production of training planes in the program and the proportionate increase in other type, especially heavy bombers.

**Efficiency**—Heavy bombers carry the war to the enemy and the increased emphasis in the program already is paying dividends and will continue to pay dividends in the destruction of Axis targets, especially industrial targets such as the one on the Schweinfurt bearing plant. Our losses were heavy in men and planes. There must be and is increased stress on bombers in the production program and a cutting down of the more quickly produced trainers. This cannot but result in a lessening of total planes produced, even though the total percentage of surprise output continues upward.

OWI points out that airplane manufacturing plants, of which there are fewer than 100 in the country, do not comprise the largest segment of this industry which lies in undergoing transformation and expansion.

**Backbone of Industry**—The backbone of industry is the more than 25,000 manufacturing plants which supply the aircraft manufacturers with almost everything that goes into airplanes. On still another level are foundries and mills turning out basic shapes and forms and at the base of the whole plane structure are the mines, whence come the materials.

All these, in addition to the aircraft plants themselves, have had to be coordinated into the program in spite of countless difficulties and in spite of the inevitable mistakes. The OWI report says the Materiel Command, the Navy's Bureau of Aeronautics and the services generally "consider that the men and women who design and make our combat planes, as well as the men who fly them, have been doing a stupendous job and doing it well."

## Lycoming Develops Light, Compact Unit

Self-contained 160-hp aircooled engine, weighing 775 lb. will power post-war vehicles.

Important post-war possibilities for bus, truck and helicopter use are seen in the new power plant developed by Lycoming Division of Aviation Corp.

William F. Wise, executive vice-president of Aviation Corp., in announcing it, described it as a complete, self-contained packaged power unit, combining a six-cylinder horizontally opposed aluminum engine with all accessories, plus a clutch and fly-wheel, into a single self-contained package.

**Three of Equal Weight**—He pointed out that since it is a completed self-contained power unit and that it weighs less than one-third as much as existing power plants of comparable output now used in buses and other motor driven vehicles, which indicates its probable post-war usage. The new engine has a dry weight of 775 lb. and develops 162 net horse-power at 2800 rpm on 73 octane fuel at sea level atmosphere.

The unit, Wise said, was designed for enclosed, or sub-enclosed, installation. The principal element of the



NEW PROPELLER X-RAY:

American Propeller Corp. describes its new 104,000 volt x-ray installation as one of the most powerful in the industry. Three capsules of such complete blade are made simultaneously in the time formerly required for one blade. Operator on left pins centimeter strip, used to check intensity of ray penetration. Next girl marks blades for identification. Third operator tests electric switch carrying car into the chamber, while operator on right holds plates which are will place under blades.

cooling system is a cast aluminum fan, or blower, mounted integrally with the flywheel and having an outside diameter of 24 1/2 in. The fan's 18 blades have curved shape.

About one-half the volume of air propelled by the blower is used for cooling purposes and the rest to maintain engine air supply in the chamber at a pressure above atmosphere on the whole side of the heavy-duty air element.

**Modifications of O-435**—The unit is a modification of the standard Lycoming O-435 aircraft engine, though the modifications required to adapt it for use as a sub-enclosed unit were not extensive. A battery system was provided in place of the usual aircraft magnets, and shape of the oil pump was changed to permit a uniform cover all bearing centers; in addition to the provision of the necessary cast clutch housing, flywheel, fan cast air baffles and the like.

## Brewster Hearings

House group investigates cause of lag in Kaiser plant production.

Public hearings were started last week in the House Naval Affairs Committee investigation into the affairs of Brewster Aeronautical Corp. on the heels of the election of

Henry J. Kaiser as president of the aircraft firm.

Kaiser, who previously had been chairman of the board, succeeded Frederick Rabel, Jr., generally regarded as a Navy man whose departure from Brewster had been permanently rumored.

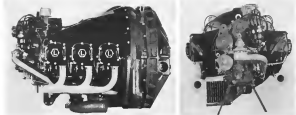
**Back Cause of Lag**—It has been no secret in aviation circles that Brewster production was bad and the House Naval Affairs Committee has indicated it will go fully into the situation and determine why. A subcommittee, which is holding hearings, is headed by Representative Brewster, of Virginia. Other members are Eiler, of Louisiana; Harris of Virginia; Groat of Indiana and Johnson of California.

## 3 Air Service Firms Merge Activities

Pasadena Southern California companies operate in "AMSCO".

Coordination of aviation service and supply activities of three Pasadena Southern California concerns has been announced by Earl Herring, president and general manager of the Airplane Manufacturing and Supply Corp., managing firm.

The parent concern will operate (Turn to page 32)



LYCOMING'S NEW 160-HP PACKAGE:

Side view (left) of new 160-hp unit which has been developed from wartime requirements by Lycoming Division of American Corp. Present use cannot be envisioned but the company expects important post-war

commercial opportunities to develop. Photograph shows location of the cooling fan on right end and mounting of accessories on left. Photograph on right shows accessory end.

# Trail Blazing in the Skies

1917-1918



"SO FAR AS CAN BE LEARNED, NO STEAMER WAS EVER MOLESTED BY SUBMARINE (DURING WORLD WAR I) WHEN ESCORTED BY A NON-RIGID AIRSHIP."

—from report of the late Rear Admiral W. M. Moffet, U. S. N., to the House Naval Affairs Committee

In the few hours of the Atlantic, Goodyear was America's principal producer of lighter-than-air ships, building upwards of 100, most of which saw active service along the sea frontier

## HOW GOODYEAR AIRCRAFT CORPORATION SERVES THE AIRCRAFT INDUSTRY

1. By constructing subsidiaries to manufacture specifications
2. By designing parts for all types of airplanes
3. By re-engineering parts for mass production
4. By extending our research facilities and the solution of any design or engineering problem
5. By building complete airplanes and airships

1942-1943



"NOT ONE OF THE THOUSANDS OF TRANSPORTS AND SUPPLY VESSELS THAT HAVE BEEN ESCORTED BY THE NAVY'S NEW NON-RIGID AIRSHIPS HAS BEEN LOST TO SUBMARINE ATTACK"

—from official U. S. Navy report, July, 1943

History repeats itself in more ways than one. Today Goodyear is again the nation's major designer and builder of airships, now equipped to mass-produce the world's largest non-rigid ships as a result of more than 30 years' continuous experience in lighter-than-air development



**GOODYEAR**  
AIRCRAFT



#### VIBRATION A Peace-Time Problem Too

Very often early reports result from vibration-related phenomena in your vacuum cleaner, radio, electric refrigerator and other household appliances. Boots Self-Locking Nuts, used on these appliances, will eliminate repair bills caused by this type of mechanical failure. Boots Nuts can't come loose, even under the severest vibration. After victory merit on products protected with vibration-proof Boots Nuts. They will be your assurance of more economical and efficient service from the household appliances you purchase.

### THEY FLY WITH THEIR BOOTS ON—SAFER

Normal vibration can severely tax a plane. But imagine the stress vibration puts on the fastenings of big bombers which have been rigged and torn by enemy fire. That these huge craft, so pampered, don't "shake apart" in mid-air is due in important measure to the stout, vibration-proof Boots Self-Locking Nuts they wear.

Boots Nuts, used on every type of U.S. aircraft, can't come loose, no matter how severe the plane vibrations. Lighter than any other nuts, Boots have greater reusability too. In addition, they withstand the corrosive action of oil, water or chemicals—literally "outlast the plane." They simplify repairs and maintenance. And they meet the exacting specifications of all government aviation agencies.

# BOOTS

Self-Locking Nuts For Application In All Industries

BOOTS AIRCRAFT NUT CORPORATION • GENERAL OFFICE: NEW CANAAN, CONNECTICUT

AVIATION NEWS • October 25, 1943

as "AMSCO" and will direct activities of the oldest names in the aircraft service industry now operating 12 plants in California.

**Tools, Parts and Service**—Of the three producing concerns, Pacific Aircraft (PAC) has been engaged in airplane and engine overhaul work since 1927, the Manufacturing Division of Airplane Manufacturers & Supply Corp. manufactures tools and testing equipment. Airplane Parts & Supply has distributed aircraft parts for the past ten years.

In addition to Herring, officers of AMSCO are: Edward O. Locher, assistant general manager and secretary and treasurer, Ralph B. Lacey, vice-president, and E. R. Johnson, vice-president in charge of sales.

### Aero Medical Meeting

Annual convention of Aero Medical Association of the United States has been transferred from New Orleans to Cincinnati, Netherlands Plaza Hotel, and the dates changed to Oct. 24-27, according to Dr. J. S. Buchanan, secretary.

## Light Plane Manufacturers Plan To Have Department in Chamber

New Division, headed by John E. P. Morgan, is expected to be in operation early next year, official announcement in Washington.

Light or personal plane makers will have their own show in the Americanized Chamber of Commerce. John E. P. Morgan, authoritatively on such aircraft and aviateer advocate of Grasshopper planes, will be in charge of the new department, which will be set up within the chamber, probably about Jan. 1.

**Planned Action**—Plans for unified action by the personal plane manufacturers started several months ago when Dennis L. Wallace, of Cessna Aircraft, proposed an association of personal plane manufacturers or the organization of such a unit within the Aeronautical Chamber. Several meetings were held, the most recent in connection with the Economic Development Committee sessions in Colorado Springs.

Three tentative plans for the new department were made and approved and submitted to the Chamber's Board of Governors. Morgan, Washington representative of several light plane companies, was prevailed on to manage the department.

**Response**—Preliminary letters to various companies planning to manufacture each aircraft brought responses from more than two dozen. Morgan said the response had been most gratifying, and particularly the spirit of cooperation shown by the manufacturers. It is now working on a program for the department dealing strictly with the problems of personal plane output, including projects to promote universal acceptance of private aircraft.

Aviation men know the widely publicized helicopter will not cloud the skies in the days right after the war, but they do expect to see a lot of these rigid wing warblers back on the job of flying for fun.

**Interested Firms**—Among companies which have declared an interest in the Chamber's new department under Morgan's direction are: Aermacchi, Beech, Cessna, Consolidated Vultee, Cubitt Aircraft, Douglas, Fleetwings (Kaiser), Fairchild, General Aircraft, Grand Rapids Industries, Globe, Howard, Intermountain Lockheed, Lancaster Airplane, McDowell Aircraft, Mooney Aircraft, Northwest Aeronautical, Piper, Republic Aviation, Ryan Aeronautical, Spartan Aircraft, Taylorcraft Aviation, Vega Aircraft and Waco.



### MOLDED FUSELAGE:

Use of molded red pine sections for fuselage construction of Anas V twin-engine bomber and observer trainer is saving strategic materials, especially stainless tubing, at plant of Cockrell Molded Aircraft, Ltd., Stratford, Ont. Top plate sections forward, center and aft sections ready to be put together after woodglue, glue-like fabric, has been glued over each section. Layer on layer of this plywood strips, laid cross-grain and permanently joined by special plastics under heat and pressure, are molded as shown. Other photo shows upturn of two halves of forward section.



AVIATION NEWS • October 25, 1943

## the unseen force that helped conquer the air...

Next to the development of the plane itself perhaps the greatest single contribution to the conquest of the air is the electron vacuum tube. The very heart of radio communications, cross country beacons and instrument landing equipment — these delicate devices provide the invisible power which enables man to fly safely. The depend-

ability of air travel is a direct reflection of the dependability and stamina of the vacuum tubes in these services. Eimac tubes are the established leaders in this field. First choice of the major airlines... first in the new developments in radio... first among the leading electronic engineers throughout the world.

Follow the leaders to

**Eimac**  
TUBES



## San Francisco to Salamaua



ROHR equipped Navy Consolidated Commodore flown under contract by Pan American to outposts of attack.

Teamwork... a vital weapon of the United Nations... begins in war production factories and extends to fighting units on every front.

Teams of Rohr Production Fighters work around the clock, preparing huge Consolidated Commodores for the next team... skilled flight crews of Pan American World Airways... on a mission of quick supply to far-flung forces of the Allies.

Teamwork is the dominant spirit of men and woman on Rohr production lines... determined to help out the time to Victory!

HELPING TO WRITE THE STORY OF TOMORROW

**ROHR**  
PARTS & ASSEMBLIES

ROHR AIRCRAFT CORPORATION • CHULA VISTA, CALIFORNIA

AVIATION NEWS • October 25, 1943

EITEL-McCULLOUGH, INC., SAN BRUNO, CALIFORNIA • Plants located at San Bruno, Calif. and Salt Lake City, Utah

Export Agents: FREAZER & HANSEN • 305 Clay Street • San Francisco, California, U.S.A.



## ARGUS—With a Hundred Eyes That Never Sleep

British fighting men know it as the *Argus*—named for a character out of Greek mythology who had "a hundred eyes that never sleep."

To Americans it is the *Conqueror*—the dependable, sturdy little utility cargo plane.

Officially designated by the U. S. Army as the UC-61A, this fifthousand number of the Fairchild airplane family is doing a heroic, around-the-clock job on many a fighting front of the United Nations.

Getting precious medical supplies through to where they are needed is a luxury.

Carrying the ammunition to where it is needed most.

Setting down and taking off in tiny patches of clear

ing, so small that larger planes could not use them.

Shuttling Army personnel between staff headquarters and "where the shooting is."

Acting as the eyes of the Army in remote or inaccessible observation posts.

These and a hundred and one other routine duties well performed have long since earned for the trim little UC-61A the glowing affection of men who have depended upon it to get them in and out of tight places.

Those who envision the universal use of airplanes after the war—both commercially and privately—may see in the four-engine UC-61A the harbinger of tomorrow's fan of the air. Another example of Fairchild's "touch of tomorrow in the planes of today."

SEE U S WAR BONDS AND STAMPS

**Fairchild Aircraft**

Division of Fairchild Engine & Airplane Corporation,  
Maplewood, Maryland — Burlington, North Carolina

## PERSONNEL

United Air Lines, with 2,000 women employees, has established a women's counselor service. Eastern division at Chicago will be headed by Mrs. Clara Fowler (MEd) and Mildred Howard will have charge of western division of San

superintendent, pilot manager and foreign projects manager. He organized the Douglas Middle East Project No. 18, at the start of the war. Recently he has been organizing the new Chinese project in California.



Francisco. Women are serving as passenger agents, traffic saleswomen, Link Trainer operators, radio operators, shop workers and at other jobs.

M. C. McDermott, cost accounting supervisor of the Miami Division, Consolidated Value Aircraft Corp., was appointed assistant division treasurer. He was formerly supervisor of inventory and budget worked and before joining Convair was with an accounting firm.

George Aronson has started a year's leave of absence from Douglas Aircraft, with which he has been connected for 20 yr., to operate an airplane modification center in Alabama for the Army. Strongly was one of the six men that made up the Douglas embryo, and has been, successively, gun on rates and targets.

Five major appointments to the supervisory staff of Flightways have been announced. S. H. Hyde has been appointed assistant to S. D. Hawks, vice-president in charge of operations. W. G. Wilson will be assistant to Kenneth E. Ditt, vice-president and chief administrative manager. A. A. Johnson is to be procurement manager, Doug S. Allen will head up the tooling program on the latest Flightways experimental airplane; and Thomas C. Edwards will be superintendent of the experimental department. In addition Flightways announced that George Coffey has become assistant chief engineer, and R. E. Weiss has been promoted to administrative engineer.

H. Delmer Blomworth has joined United Air Lines' Chicago office as a vice and traffic manager. According to United, the position is the first of its kind in the air transportation field, created in view of the steadily increasing volume of work being done at lower air shipments and the need for accurate information.



### HEADS SAE CONFERENCE:

C. L. "Kelly" Johnson, chief research engineer of Lockheed Aircraft Corp., who was general chairman of the recent meeting of the Society of Automotive Engineers in Los Angeles.

Capt. Stan A. Palmer, a member of the 6888 Central Postal Directory, with more than 15 years' experience in his credit, is a best pilot and assistant operations officer at the U. S. Army flight base near the main Curtiss-Wright Co. Buffalo plant.

Capt. Palmer was shot down in combat during his Guadalcanal experience, parachuting to the ocean 50 mi. north of Vella Lavella where he floated for a day and a night in his life raft.



### ALL AMERICAN REPRESENTATIVES AT PICKUP INVESTIGATION:

Officials and representatives of All American Airlines, only certified pickup operator, who told us many recently at Civil Aeronautics Board hearings on local-feder-pickup service. Left to right are Austin M. Zimmerman, AAA general counsel, Jack Lee, CAB member, C. Edward Leamer, CAB chief examiner,

Prof. Ross M. Cunningham, MIT, who conducted All American's tender studies, Donald Egan, CAB member, Harry R. Strimper, AAA vice-president, Haley R. Bailey, AAA president, William J. Madden and Albert F. Bevil, CAB examiner in charge of the investigation, and Capt. Thomas T. Kitchin, AAA's chief pilot.



NEW CURTISS-WRIGHT VICE PRESIDENTS:

Frank N. Harrison (left), manager of manufacturing for the International Harvester Co. and widely known in Middle Western industry and E. J. Harrington (right), coordinator of planning, production and material problems for the Lockheed Aircraft Corp., who have been elected vice presidents of Curtiss-Wright Corp. Harrison, for the present, will make his headquarters at the plant at Columbus, and will be in charge of operations there. Harrington will be at the New York office as a member of the executive manufacturing staff, but is temporarily assigned to the Columbus factory.

Albert Laenen, legal adviser to Fletcher Aviation Corp. on a part-time basis since the company's inception, has associated himself with Fletcher as head of its legal department, with headquarters at the Painesville plant.

Bill Cross, formerly accounting director

at Fletcher Aviation, Pasadena, has become works manager of Fletcher Aircraft in Burbank.

Brig. Gen. Franklin G. Currell, chief of the Engineering Division, Materiel Command at Wright Field, has just returned from a six weeks' tour of the

European, Northwest African and Middle East war theaters, via Air Transport Command, with an airline mileage of more than 20,000 mi.; Gen. Carroll and Col. Donald L. Felt, of bombardment branch, engineering division, who went alone, visited field staffs, advanced air bases and depots, and conferred with air commanders of the various theaters to get data on recommended changes in equipment and on future logistical requirements.

Philip H. Puckett has resigned as vice-president of Standard Oil Co. of California, after 24 yr. service during which he took a leading part in the development of aviation. He directed the painting of pink signs on warehouse roofs as the Pacific Coast and developed the plan to install high-power aviation beacons at seven overseas points.

E. A. Kersh has been named cabinet officer for property for United Air Lines, and is to have charge of a new department operating within United's treasury department at Chicago headquarters. He has been with the line for 16 yr and will have 11 W. Business as assistant.



Glenn C. Brown is now station manager of Delta Air Lines' office at the Baton Rouge airport where operations began Oct. 10. Brown was previously at Dallas, Shreveport and Atlanta. A. L. Hicks, formerly with Delta in Fort Worth and Shreveport, will be station manager at the Alexandria airport. Delta has assigned 34 persons to New Orleans, under the direction of L. H. Champagne, in connection with the opening of its new route from that city to Fort Worth.

George F. Doss, formerly Miami City traffic manager for National Airlines, has been promoted to district traffic manager and superintendent of reservations for the entire line. Jerry D. Quam, formerly Jacksonville station manager for National Airlines, Inc. has been promoted to superintendent of passenger service in Jacksonville. Nancy T. Jackson has been named Miami city traffic manager of National Airlines.



Jackpot	Draw	Getmax
Airlines, Inc., after joining the line from the Columbus Hotel in Miami		

## TRANSPORT

## Missouri-Pacific Railroad Asks To Add Air Service for 108 Cities

Application brings to more than 60 the number of common carriers which have filed petitions with CAB; More truck and steamship lines apply.

By BARBARA FREDERICK

Application of a new company associated with Missouri-Pacific Railroad, tied with the C&N last week brought to over 60 the number of common carriers who have filed for air service of one sort or another.

Three-quarters of the shares owned by the company, Eagle Airlines Inc., St. Louis, Mo., incorporated in Delaware, are owned by Guy A. Thompson, trustee for Missouri-Pacific Railroad. The other 25 percent is owned by Texas & Pacific Railroad Co.

**\$4,000-Mile Network**—Eagle vascu-  
le operates over a 4,000-wy. network  
on 16 routes, linking 108 cities, pro-  
viding scheduled, non-scheduled  
and charter service for persons,  
mail, baggage and property of all  
kinds.

Operating in Missouri, Kansas, Arkansas, Texas, Louisiana, Nebraska, Oklahoma, Tennessee and New Mexico, the routes are laid out to parallel the rail routes of Missouri-Pacific Transportation Co., Texas & Pacific Coaches, Missouri-Pacific Freight Transportation Co., and Texas & Pacific Motor Transport Co., which now provides motorbus service over approximately 4,588.6 mi. and motor truck service over about 9,505.82 mi.

**Coordinated Service—Helicopters,** as well as conventional transport planes would be used and coordinated on call-highway service is planned. Some terminals of the proposed service are St. Louis, Memphis, New Orleans, Brownsville, Louisville, El Paso, Dallas, and Chicago.

Further augmenting the list of applicants from common carriers were two filed by *Airborne Air Freight Corp.*, Detroit, and one by *Consolidated Express, Inc.*, Loganport, Ind. The former, owned by Overseas Freight Corp., applied for unscheduled service using planes, heli-

captains and tender freight planes to transport all types of automobiles and chassis, originating in Illinois, New York, Ohio, Pennsylvania and Wisconsin, located within 100 mi of the Great Lakes and going to all points in the U.S., and to transport general merchandise on the return trip.

**Further Application**—The company filed a further application from the same Great Lakes area for annual bills destined for Canada and Mexico. Overlake Freight Corp., through its subsidiary, Nicholson Universal Steamship Co., specializes in transportation of water to and from coast-

in the Great Lakes, and through its subsidiary, Great Lakes Forwarding Co., carries cargo by highway through Connecticut, Delaware, Massachusetts, Maryland, Michigan, New Jersey, Ohio, Pennsylvania, and Rhode Island. Automobile Air Freight Co. plans to offer a coordinated highway-air and water-air service.

United Express, Inc., which operates many services in Indiana and Michigan, has asked for 500 scheduled operations, covering general merchandise sales, over which sales will bring in \$100 million from Indianapolis with 2000 scheduled terminals. It proposes to establish 1000 of scheduled truck-line sales and 500 of through service on its line, but to establish other other 20 and 1000 scheduled and 1000 other.

National Alliance filed four applications asking recognition of its status as a national political party. The party is based in Washington, D. C., and claims to have 100,000 members in 48 states. It claims to have won 10 million votes in the 1964 election. The party is based in Washington, D. C., and claims to have 100,000 members in 48 states. It claims to have won 10 million votes in the 1964 election.

**Northwestern skink**, seeking to integrate itself into a high war-torn zone. The skink is a small, brown lizard with a dark stripe along its back and a lighter stripe along its side. It is found in the mountains of the Sierra Nevada, where it is known for its ability to climb steep, rocky slopes. The skink is a generalist feeder, eating a variety of insects and small invertebrates. It is also known for its ability to change color to match its surroundings.



UNITED'S ALL-CARGO DC-8

With all passenger furnishings out, DC-1's are being used by United Air Lines on its new all-cargo coast-to-coast service. Capacity is three tons of cargo, compared with 2,400 lb. average carried on United's regular Mainliners, passenger-cargo combinations. Interior views show how it is done.







## U.S. Chamber Expected To Stand by Its Report

Cooper's protest on air transport policy only one record.

United States Chamber of Commerce sources say it is doubtful that the report on aviation by its special committee on International Transport will be reconsidered by the board, which has approved it.

Request for reconsideration was made by John C. Cooper, Pan American Airways vice-president and member of the committee. He told Eric Johnston, chamber president, in a dissenting letter that the policy agreed to by other committee members in effect proposed new limitations in terminal, surface, and enroute competition, and a new government policy of "freedom of innocent passage."

**► Chairman's—**At the chamber it was pointed out that the committee's policy statement has been circulated to members of the chamber, who have until Oct. 28 to express opposition if they feel so inclined, and that 20 percent of the chamber's voting strength representing 20 states must do so before the board will need to change its stand. The next meeting of the board is scheduled to be held on Nov. 17 in Kansas City.

As this is written, an opposition other than Cooper's has been received, except for two other airline committee members who commented conditionally from the surface participation recommendation if it involved changes in law. Pan American has an associate, non-voting membership in the chamber.

## 5 Lines Join Douglas In DC-4 Delivery Plan

Map program for acquisition of planes for post-war operations.

Five airlines are joining Douglas Aircraft Co. in plans to secure quick large-scale delivery of new DC-4 transport planes when the war ends. American, Eastern, Pan American, United and Western are negotiating for the new ships which, while smaller than the original DC-4, are expected to have greater capacity and performance.

**► Cost Fubadine—**This original ship was tested prior to 1940 under agreement with Eastern, United, TWA, American and Pan American, but its cost of \$1,500,000 and high speed made operation impractical. Since the C-54, cargo version of the DC-4, has been developed it is expected that post-war conversion of the C-54 production line to

DC-4 output will involve only minor interruptions, permitting almost immediate delivery to airlines.

**► Costability—**The current agreement indicates TWA, which pulled out of the original setup during development tests by buying Boeing Stearman, is definitely losing its post-war hopes on the Lockheed Constellation.

Usual estimates are that the new DC-4s, which would carry 30 passengers plus cargo, may cost \$450,000 each. No details have been given by Douglas, however, on costs under the agreement terms.

## Airlines Hail Easing Of Blackout Rules

TWA urges further relaxation when planes are visible from rail, bus lines.

The new relaxed cabin window blackout policy is finding favor generally with the airlines. First official reports came to the industry last July indicate satisfaction. For the most part, with few suggestions for change. The reports are being made monthly to the Air Transport Association, starting this month.

Transcontinental & Western Air was virtually the only line to suggest additional changes. It said there should be further easing of blackout restrictions where war plant installations are readily visible from the highway or railroad.

**► PCA Situation Keen—**Pennsylvania-Central Airlines has had a light situation at Norfolk, but this has been eased somewhat with its shift to the Municipal Airport after months of landing at the Naval Air Station. Previously plane windows were covered for about 15 min coming into the station, and times in which passengers rode from the naval field to the gate of the air station also were blacked out. Curtains still are kept closed for the 15 min and while the planes are on the ground. At Buffalo, Baltimore, Birmingham, Knoxville and Washington, PCA has three-minute "curtain periods" before landing and after takeoff.

The cabin window blackout policy, started in April, 1943, has been a self-policing operation. Seven airlines are members in the regulation, and the airlines must be drawn before landing and after take-off, for three minutes at Dallas, Tulsa, Colorado Springs, San Francisco and Oakland, and five at New York and San Diego.

## \$100,000,000 Rail Equipment Firm Re-enters Aviation with New Gliders

Launching of Airborne Transport, Inc., new West Coast firm manufacturing troop carriers, marks return of General American Transportation Corp. for another try at air industry.

By ROGER WILCO

General American Transportation Corp., giant railroad equipment manufacturer and leaser, and popularly identified as GATX, has launched Airborne Transport, Inc., a new manufacturer of large troop carriers on the West Coast. This marks the return of a potent transportation agency to the aviation field.

Background and status of this aviation transportation company are such that its aviation plans can hardly be ignored. Once before, GATX entered the aviation industry but withdrew. Evidently, the company has not given up its aspirations in this industry.

**► Acquired Barkley-Grove—**Early in 1939, GATX acquired control of Barkley-Grove Aircraft in Detroit. This represented a small commitment and it was indicated that Barkley-Grove would serve as an experimental laboratory for testing new aviation plans. Shortly thereafter, GATX tasked a comprehensive survey entitled, "A brief study and a plan for the participation of Airborne Transport, Inc. in air freight operations in the United States."

Company proposed that railroads and airlines join in a common effort toward the fullest possible development of air cargo service. GATX would act as intermediary and provide management expenses in the consulting phase in implementing the program.

**► Mr. Carver Cold—**This proposal was placed before the air carriers and the railroads. The airlines cold-shouldered the idea. The railroads, through the Association of American Railroads, gave it formal consideration. It is not known what action was taken. The railroads took in this respect other than to incorporate this proposal along with the broad survey being accorded the entire consideration of air freight operations.

In any event, with negative interest on the part of the airlines, the GATX proposal because of academic interest. The company subsequently early in 1940, purchased a very small stake in Aviation and Transportation Corp., which was merged into the existing Aviation Corp. Some observers believed at the time that in this manner, GATX might gain entry to American Airlines (then about 35 percent controlled by Aviation Corp.), as well as to other extensive aviation facilities under the jurisdiction of the many-sided holding company.

In June, 1940, Aviation Corp. purchased the Barkley-Grove properties, GATX receiving additional stock in the process.

**► Test Completed—**Evidently, however, GATX felt its aviation experiment was completed and also perhaps not desirous of being identified with the Aviation Corp. It disposed of its stake in that holding company.

GATX has a highly successful record of progressive management in transportation, particularly in the railroad field. Its permission in turning to aviation, therefore, is being watched with keen interest. Further, the company has the resources and means to follow through any program it may choose to support.

**► Resources—**Total resources of the company are in excess of \$100,000,000. This is without benefit of government capital. Principal activity is the building and leasing of all kinds of railroad freight cars. At last reports, the company owned about 35,000 freight cars of all types, representing the largest fleet owned by one enterprise.

In addition, GATX owns and operates extensive storage and terminal facilities. These properties, located throughout the country, are used for storage of oil and other liquid commodities. Further, the com-

pany owns a controlling interest in Pressed Steel Car Co., Inc., builder of railroad freight and passenger cars. Together, the two companies own General American Aerospace Co., builder of motor buses.

Now, success in the air cargo glider field would give GATX a firm foothold in aviation.

## National Aviation Cuts Air Stocks Again

Investment trust continues shift to diversified industrial securities.

National Aviation Corp., which started as an aviation trust, continues to withdraw from the aviation industry. This was disclosed by substantial liquidation of aviation securities between June 18 and Sept. 28. This is a continuation of the program started in November in Aviation News of Aug. 20.

Both aircraft manufacturing and air transport equities were sold and industrial securities purchased during this recent period.

**► Sold—**Sold—Aircraft common stocks sold consisted of the following:

Dell, 1,500 shares; Boeing, 500 shares; Con-Valley, 100 shares; Grumman, 600 shares; Lockheed, 600 shares; United Aircraft, 1,000 shares; Curtiss-Wright, 7,000 shares.

Sale of the Curtiss-Wright stock left National Aviation without any interest in that issue. However, 20,000 shares of Curtiss-Wright "A" stock were sold because of the income this equity affords.

Sales in the airline group took the following form:

Shares	Value
Chicago & Southern	100,000
Kodak	100,000
Northwest	100,000
Penn-Central	100,000
TWA	100,000
United	100,000

Holdings in Boeing were continued to be made in diversified industrial stocks. These purchases consisted of 1,500 shares each of Firestone Tire, General Electric, General Motors, Goodrich, Gulf Oil and Standard Oil of New Jersey.

This continued shift from aviation to other industries, merely represents a manifestation by National Aviation that the outlook for the aviation group is less favorable than other enterprises.



WINNERS OF TWA WRITING AND PHOTO CONTEST.

V. P. Chung, TWA's traffic vice-president, is congratulating (left to right) Robert S. Bell, aviation editor of Detroit News, winner in the open category division; Max Karant, editor of Flying, first place in the magazine division; Alexander McWhorter, now of Aviation News and other McGraw-Hill aviation publications, who as assistant editor of the Dayton, Ohio, Journal-Herald won first place in the division of newspapers under 150,000 circulation; and William H. Dymally, staff photographer of Buffalo, N. Y., Courier-Express, first prize in the photographic division. The trophies will be held a year by the publications the winners represented. The annual contest is the sixth sponsored by TWA.

## High Time for Unity

THE AIR TRANSPORT INDUSTRY is getting a black eye in congressional and high government circles. So much bickering and disagreement aired in the press has exaggerated the industry's shortcomings.

Domestic lines snipe at each other over rights to foreign routes while the big fellows slug it out among themselves. Smaller lines snipe at the big fellows over the domestic pie. Individual carriers are making private statements that conflict with their public pronouncements. Meanwhile, bus and truck lines and the railroads through their lobbyists are capitalizing on the situation.

The suspicion is rising rapidly on the part of re-

sponsible and powerful people in the capital that the industry has lost its ability or willingness to sit down and work out common problems.

This week the Lea bill and other legislation of vital importance to air transportation come up for debate and probably a vote in the House. It may not be an easy fight.

The Lea bill may be defeated. Or the House may open up the air to any corner, and if it does the senate may very well go along. That would be a stiff price to pay for what until now has been considered free publicity. Why not unity now, to meet the bigger problems that are on the horizon?

## Sugar Coating Our Losses

GENERAL ARNOLD last week explored what he called a tendency of the press to over-emphasize our bomber losses over Axis territory. Many of us think the press hasn't told enough about our losses in the air. War department statements on progress of the air war have put persistent emphasis on the box scores of our combat craft. American planes have done a remarkable job, but there is an increasing attitude among some aircraft industry officials and very definitely evident from returning airmen that the box scores have made the air war sound easier than the particular statistics being released would indicate.

The result has been excessive optimism about the course of the war which has probably had an important effect on the drop in morale of aircraft workers and has contributed to the high turnover rates in warplane plants.

More criticism of the war department's over-emphasis on the "favorable" numerical ratio between the U. S. and the Axis appears brewing because the official announcements have diluted the nation's sense of values.

The American people have not realized the severe losses in terms of production man-hours and crews lost.

Only in fighter engagements, such as those between Lightning and the latest Focke-Wulf models, are the odds even in terms of production manpower and crew. From a production point of view the relative stakes between the U. S. and the Japs are such that American units must knock down 2 to 3 Zeros for every one of our own fighters lost in order to

claim a legitimate net gain over the Pacific enemy.

It is quite true as pointed out by the News' military commentator this week, that damage inflicted on German industry may compensate for losses of dozens of Fortresses. The point is, however, that the average person does not realize that the man-hour production cost of our bombers is several times the value of German and Japanese fighters. Nor does he realize that the overwhelming majority of crews of U. S. bombers shot down by the enemy are complete losses, while many Axis flyers come down in friendly territory and ultimately rejoin their units. Even if every man in every plane on both sides was killed, it is pointed out, the American crew losses would run five to ten times those of the enemy.

For example, official OWI figures recently showed U. S. fighters in the first six months of the year had little more than 2 to 1 advantage over enemy fighters. Yet, many American fighters represent substantially more production time in man-hours, and it is probable that American pilot losses were relatively higher than the Axis.

There is no doubt that the United States expects losses in a war, and that it can afford them better than the Axis countries, but the fact remains that continual harping on box scores is not helping improve the nation with the urgency of overcoming manpower difficulties and getting more aircraft to the front.

Only if every type of warplane needed is turned out according to schedule can the United Nations continue to reflect satisfaction with the course of the air war.

ROBERT H. WOOD

## MULTUM IN PARVO



The old Latin phrase, *multum in parvo*—"much in little," has attained a significance in World War II far beyond its original meaning. This is particularly true in the aircraft industry, where little things, inventions and developments perhaps small in themselves, have contributed much to Victory—through speeding and multiplying production.

For example, at McDonnell, we use a *vari-angle*\* attachment to a mangle, which saves as much as a third of the total manufacturing time on down blocks—plus largely eliminating danger of deviation.

Using this device, even an inexperienced workman may perform in 15 minutes an operation which formerly required four hours.

This easily operated machine may be used on all types of laminates, materials, stone, and plastics from blocks, grafting steel pipes, bending human beings before they

\*See page 12 for further information contact your local machinery supplier

are assembled, and roughing down wood patterns. Invented by a member of our organization, the *vari-angle* attachment is not limited to mangles, but can be adapted to any shearing machine—shapers, routers, milling machines, etc.

This is but one of many developments numbered among the achievements of McDonnell personnel. For in their tasks of building planes, parts, and plastics for war, they constantly ask of themselves—as they study each operation—"Can it be done better and faster?"

Such time-saving devices as the *vari-angle* attachment—which can speed certain operations as much as 1600%—constitute a most constructive answer.

We believe the active interest of our personnel in seeking constantly to improve production methods, is responsible in no small part for McDonnell's record of meeting production requirements on schedule.

**McDONNELL Aircraft Corporation**  
Manufacturers of PLANE • PARTS • PLASTICS • SAINT LOUIS • MEMPHIS •



## "THUNDERBOLT-WORLD"

The "Thunderbolt" was conceived for one purpose... to fight in the Stratosphere.

There, over seven miles straight up where few other aircraft go, is the "Thunderbolt-World." Ordinary planes that perform brilliantly at lower altitudes, lose their speed and maneuverability as they approach the Stratosphere.

Up between thirty and forty thousand feet, the Thunderbolt flies at more than 400 miles an hour... spits sudden death from eight 50 calibre machine guns

in its wings. It is a deadly weapon... guardian of our high-flying bombers.

Only by experience and scientific research in the Stratosphere and its effect on motors, parts, materials and man himself could such a plane have been engineered. Republic designers and Army Air Forces experts have a rare understanding of Strato-mechanics.

After the war, this knowledge will be used to speed up communication between nations... to bring the peoples of the earth closer together.



REPUBLIC P-47 THUNDERBOLT

**REPUBLIC**

*Aviation*

SPECIALISTS IN HIGH-SPEED AIRCRAFT

